



BRIEF REPORT

SMOKING PATTERNS OF LOW-INCOME
ETHNOCULTURALLY DIVERSE PREGNANT WOMEN:
ARE WE CASTING THE NET WIDE ENOUGH?

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Abstract — Cigarette smoking poses significant risk to mother and infant during pregnancy and the postpartum period. Recruitment of pregnant smokers to intervention studies has often been reactive and has excluded certain subgroups of women, such as those who have recently quit smoking. In this study, we examined smoking patterns among a proactively recruited sample of women presenting to six urban community maternity clinics. The current report describes the patterns of smoking in this population of ethnoculturally diverse low-income urban pregnant women and examines differences across subgroups. The majority of the total sample in the current study reported that they had never smoked. Of the total, 30% reported having "ever" smoked and 16% were current smokers. Of the group of "ever" smokers, 18% quit greater than 12 months before pregnancy, 5% quit 0-12 months before pregnancy and 23% quit during this pregnancy. On the average, women who quit during pregnancy did so about 5 weeks after diagnosis. Of those women who continued to smoke during pregnancy, the average number of cigarettes smoked per day was 10 ± 8 . Differences were found in smoking patterns across the ethnocultural subgroups. Recruitment represents the first and one of the most important phases in intervening with pregnant women. Inclusion of both current smokers and recent self-quitters takes the fullest advantage of the window of opportunity to help women quit smoking and remain cigarette free for good. © 1998 Elsevier Science Ltd

Prevalence estimates of smoking among pregnant women continue to exceed objectives outlined in the Healthy People 2000 (Windsor et al., 1993). To maximize the chances of reaching this target for smoke-free mothers, intervention opportunities need to be provided to all who may benefit. For example, women who are smoking at a low rate (e.g., <10 cigarettes per day) or who have recently quit smoking are often excluded from intervention programs. However, the majority of women who quit smoking because of their pregnancy relapse either during pregnancy or within a year after delivery (Quinn, Mullen, & Ershoff, 1991; McBride & Pirie, 1990; O'Campo, Brown, Faden, & Gielen, 1992). The majority of intervention studies have focused exclusively on women who are currently smoking at the time of the initial study contact (Ershoff, Mullen, & Quinn, 1989; Secker-Walker et al., 1994; Byrd & Meade, 1993; Burling, Bigelow, Robinson, & Mead, 1991; Valbo & Schioldborg, 1991), thereby systematically excluding those who have made preliminary attempts to quit smoking by cutting down to a low rate or quitting completely. Women who have already tried to quit just prior to or following pregnancy onset also need support to continue their pro-

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cess of change into the postpartum period. Postpartum studies of pregnant smokers consistently note that women who attempt to quit smoking during pregnancy have great difficulty maintaining their success following birth (Quinn et al., 1991; McBride & Pirie, 1990; O'Campo et al., 1992). These findings underscore the importance of intervening within and beyond the pregnancy for women who attempt to quit smoking during pregnancy.

To take full advantage of all opportunities to help women quit smoking during pregnancy, we need more information on the typical patterns of smoking during pregnancy. Such information will not only help identify who should be targeted, but will also help guide the development of interventions tailored for pregnant smokers. Smoking in pregnancy is a unique challenge; therefore, the evolution of intervention methods should be focused on more carefully tailoring the interventions to the needs and characteristics of this special population. The purpose of the current report was to describe the patterns of smoking in a population of ethnoculturally diverse low-income urban pregnant women attending public maternity clinics. Specifically, this article addresses the following questions: What are the smoking patterns of low-income ethnoculturally diverse pregnant women? That is, what proportions never smoked, currently smoke, or recently quit smoking due to pregnancy (i.e., quit within the past 12 months)? Of those who smoke during pregnancy, what are their smoking rates? Are there differences in smoking patterns across ethnocultural subgroups?

METHODS

Procedure

As part of an ongoing intervention study, all pregnant women presenting for prenatal appointments at six urban obstetrics clinics in a New England city were screened for smoking status. Women were approached while waiting for a routine obstetrics visit. A brief paper-and-pencil questionnaire assessing smoking status and basic demographic information was administered. Questionnaires were available in English and Spanish. Women who were illiterate or requested assistance were read the questionnaire items and asked to respond verbally.

The screening questionnaire used a multiple-choice format as recommended by Mullen, Carbonari, Tabak, & Glenday (1991) to improve accurate disclosure of smoking status in this special population. The specific items were adapted and expanded from those used in the Mullen et al. (1991) study.

Participants

A total of 1,971 women were screened for smoking status between May 1995 and January 1997. Demographic characteristics of these women are found in Table 1. Women categorized as "Hispanic" included women who identified their ethnic origins from Puerto Rico to Central and South American countries. "Asian" women identified their ethnic origin as Laotian, Vietnamese, Chinese, and Cambodian. Women categorized in the "Other" category included women who identified their ethnic origin as Cape Verdean, Caribbean, or recent European immigrants. Of the women screened, 43.6% were Hispanic, 10.3% African-American, 26.9% White, 7.1% Asian, 1.3% Native American, and 10.9% "Other" ethnicities. Of the total sample, 13% identified Spanish as their primary language. The mean age of women presenting to these clinics was 24.3 years ($SD = 6.0$ years). The mean gestational age at the time of screening was 25.6 weeks ($SD = 9$ weeks).

Table 1. Sociodemographic characteristics of 1971 low-income pregnant women attending six urban obstetrics clinics

	Mean	SD
Age in Years	24.3	6.0
Gestational Age in Weeks	25.6	9.2
	<i>N</i>	(%)
Ethnicity		
Hispanic	816	43.6
African-American	192	10.3
White	503	26.9
Asian	132	7.1
Native American	24	1.3
Other	204	10.9
Primary Language		
English	1684	85.4
Spanish	259	13.1
Other	28	1.6
Smoking Status		
Never Smoker	1376	69.8
Previous Smoker	275	13.9
Current Smoker	317	16.1

RESULTS

Overall smoking patterns

As shown in Table 1, the majority (70%) of the total sample of pregnant women reported that they had "never" smoked, 14% indicated that they had previously smoked but quit, and the remaining 16% were current smokers. Table 2 focuses only on those women who reported having ever smoked. Of this group, more than half (53%) were still smoking at the time of the study assessment (mean weeks' gestation = 25.6; $SD = 9.2$), 18% had quit more than a year prior to pregnancy, 5% had quit within a year

Table 2. Smoking patterns of low-income pregnant women who reported 'ever smoking' ($N = 592$)

	<i>N</i>	(%)
Quitters		
Quit smoking > 12 months prior to pregnancy	109	18.4
Quit 0-12 months prior to pregnancy	32	5.4
Quit during pregnancy	134	22.6
Mean number of weeks following pregnancy confirmation	4.6	6.0
Current Smokers	317	53.5
No Rate Reduction	70	22.0
Mean Smoking Rate	15.7	9.3
Reducers	235	74.1
Mean Smoking Rate Before	23.6	13.1
Mean Smoking Rate Now	9.1	6.9
Occasional Smokers	12	3.7
Mean Times Smoke/Week	4.6	5.5

prior to pregnancy, and 23% had quit during pregnancy prior to the assessment. On the average, women who quit during pregnancy did so about 5 weeks after learning of their pregnancy ($SD = 6$ weeks). Of those women who continued to smoke during pregnancy, an average of 10 cigarettes were smoked each day ($SD = 8$). Of those women who identified themselves as current smokers, 74% indicated that they had reduced their smoking rate due to pregnancy from an average daily rate of 23.6 cigarettes ($SD = 13.1$) to an average of 9.1 ($SD = 6.9$). Twenty-two percent did not indicate a reduction in their smoking rate (current rate/day = 15.7; $SD = 9.3$). The remaining 4% of current smokers reported that they only occasionally smoked, with an average of five times per week ($SD = 5.5$). No age differences were found among these groups. When current smokers were compared with previous quitters, smokers were found to be older (t -test = 2.3, $df = 544.1$, $p < .02$) and earlier in pregnancy (t -test = 2.94, $df = 563$, $p < .003$).

Smoking patterns across ethnocultural subgroups

The pattern of smoking by ethnic group is presented in Table 3. Asian women showed the lowest prevalence rates of current smoking (4.6%), while Native American (29.2%) and White (33.5%) women showed the highest rates. Hispanic (9.0%) and African-American women (13.8%) had intermediate levels of smoking during pregnancy.

The specific proportions shown in Table 3 indicate that, although the majority of women in all groups reported being "never smokers," very different patterns occurred for each ethnic subgroup. In particular, 85% of Hispanic women were either "never smokers" or long-term quitters, whereas 79% of African-American women were in this group, and 51% of White women. Therefore, between 15% (Hispanic), 49% (White) and 50% (Native American) of pregnant women may benefit from interventions designed to help women quit smoking (current smokers) and/or prevent relapse (current smokers and recent quitters) during the pregnancy.

Because Asian and Native American women comprised small subgroups of the total sample, as well as the current smoking subsample, these groups were omitted from further statistical comparisons. Chi-square comparisons across ethnic subgroups, including Hispanic, White, and African-American women, indicated significant differ-

Table 3. Patterns of smoking among pregnant women by ethnic group

Ethnicity	Never Smokers		Quit More than 12 Months Pre-pregnancy		Quit 0-12 Months Pre-pregnancy		Quit During Pregnancy		Current Smokers		Total Women Identified for Intervention	
	<i>N</i>	(%) ^a	<i>N</i>	(%) ^a	<i>N</i>	(%) ^a	<i>N</i>	(%) ^a	<i>N</i>	(%) ^a	<i>N</i>	(%) ^a
Hispanic	661	81.6	30	3.7	11	1.4	35	4.3	73	9.0	119	14.7
African-American	131	69.7	18	9.6	1	.5	12	6.4	26	13.8	39	20.7
White	206	41.5	47	9.5	14	2.8	63	12.7	166	33.5	243	49.0
Asian	120	91.6	4	3.1	0	—	1	.8	6	4.6	7	5.3
Native American	11	45.8	1	4.2	1	4.2	4	16.7	7	29.2	12	50.0
Other	159	77.9	7	3.4	1	.5	16	7.8	21	10.3	38	18.6

^aPercentage of total ethnic sample.

ences for smoking status (current smoker, never smoker, recent quitter—i.e., quit within 1 year prior to pregnancy, long-term quitter—i.e., quit greater than 1 year pre-pregnancy) (chi square = 232.65, $df = 6$, $p < .001$). The average smoking rate among these three subgroups also indicated significant differences ($F = 3.84$; $df (2,58)$, $p < .03$). Tukey tests showed that White women smoked significantly more cigarettes per day (mean = 19.1 ± 9.4) than did African-American women (mean = 10.5 ± 6.4). Chi-square comparisons of current smokers vs. nonsmokers (never smokers and quitters) indicated that *nonsmokers* were more likely to be Hispanic or of non-White racial origin (chi-square = 183.2; $df = 3$; $p < .001$).

DISCUSSION

The findings of the current study underscore the importance of casting the widest net when developing and implementing smoking-cessation interventions for pregnant women. Proactive screening of all pregnant women is the first step needed to help identify all those who may benefit from intervention. Given the low rates of quitting during pregnancy and the high rates of relapse both during pregnancy and postpartum, women across all the stages of change, as described by the Transtheoretical model, should be targeted for intervention. In this study only 16% of the total group indicated that they were current smokers (pre-action stage). However, targeting women who had quit smoking up to 1 year prior to pregnancy increases the potential reach (up to 25% for the total sample) and maximizes the potential long-term impact on smoking behavior.

For example, interventions provided to the current study sample targeting only current smokers would result in a missed opportunity to support long-term maintenance and assist in relapse prevention in a substantial subgroup of women who have quit on their own (action and maintenance stages) related to their pregnancy. Given the high rates of postpartum relapse, every opportunity to promote a lifelong smoke-free lifestyle should be seized. Women who have quit smoking related to pregnancy may benefit from motivational messages about the dangers of second-hand smoke on the developing child and strategies to help them manage temptations to smoke, especially during stressful situations.

The current findings also highlight the importance of understanding the subgroups of women being targeted and the need for sensitivity to their individual characteristics and needs when developing and implementing interventions. For example, smoking prevalence rates in this study ranged from 4.6% in Asian women to 33.5% in White women. In addition, when focusing on the broader group who may benefit from intervention (all stages of change), the proportion in subgroups ranged from 5.3% in Asian women to 50% in Native American women.

Further exploration of the reasons for the differences seen in smoking patterns across ethnocultural subgroups may provide information useful in tailoring smoking-cessation interventions to maximize effectiveness. For example, understanding the meaning of smoking during pregnancy to women of different ethnocultural backgrounds may help tailor specific motivational messages to promote change across groups.

In summary, recruitment represents the first and one of the most important phases in intervening with pregnant women. Results of this study underscore the importance of using proactive recruitment and including the broadest group of women who may benefit from intervention. Inclusion of both current smokers and recent self-quitters

takes the fullest advantage of the window of opportunity provided during pregnancy to help women quit smoking and remain cigarette free for good.

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